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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/779,092	02/08/2001	William C. Hardy	RIC-00-031	1671

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EXAMINER	
TAYLOR, BARRY W	
ART UNIT	PAPER NUMBER
2643	14

DATE MAILED: 04/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/779,092	HARDY, WILLIAM C.	
	Examiner	Art Unit	
	Barry W Taylor	2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 January 2003 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-61 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-61 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11 and 13
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollier et al (6,304,634 hereinafter Hollier) in view of Malvar (6,256,608) or Di Pietro et al (5,867,813 hereinafter Di Pietro) or Chen et al (6,356,601 hereinafter Chen).

Regarding claims 1, 18, 29, 37, 49 and 61. Hollier teaches a system and method of evaluating quality in a telephonic voice connection (Title, abstract) in a telecommunication network, comprising:

a measuring circuit operative to measure at least one characteristic of the telephonic voice connection (Title, abstract, col. 1 lines 8-67, col. 2 lines 16-67, col. 3 lines 1-60, col. 4 lines 1-67, col. 5 lines 12-65, col. 6 lines 1-67, col. 7 line 25 – col. 16 line 34); and

a processor coupled to the measurement circuit, the processor being operative to calculate a solution to at least one empirically derived mathematical function by using the at least one measured variable in the at least one empirically derived mathematical function, whereby the solution is an estimate of likely user perception of the quality of the telephonic voice connection (Title, abstract, col. 1 lines 8-67, col. 2 lines 16-67, col.

3 lines 1-60, col. 4 lines 1-67, col. 5 lines 12-65, col. 6 lines 1-67, col. 7 line 25 – col. 16 line 34).

Hollier does not explicitly show the at least one measured characteristic as an independent variable.

Malvar teaches a system and method for real time parametric modeling for a probability distribution function that approximates the users perception of the quality of a voice connection (abstract, columns 1-4, col. 5 lines 30-67, columns 7-12, col. 13 line 43 – col. 16 line 66, col. 18 line 50+). Malvar discloses using a modified probability distribution model wherein the shape is controlled by a single parameter, which is directly related to the peak value of the coefficients (columns 19-22) thus minimizing computational overhead for model selections.

Di Pietro teaches a method and apparatus for automatically and reproducibly rating the transmission quality of a speech transmission system wherein differences between characteristic values are feed to a neural network which classifies the quality of the difference signals as Good, Medium and Bad, and a defuzzyfication logic circuit further refines the quality classification output (Title, abstract). Di Pietro figure 5 shows that the tree outputs are scaled into a range of 0 to 1 and the final classification is determined by calculating the center of the area covered by the Good, Medium and Bad signal. Di Pietro also discloses that the so-called Bark scale may be used to define a twodimensional spectrogram.

Chen also teaches a method and apparatus for detecting zero rate frames in a communications system wherein a quality metric is computed and compared against a

threshold value. The threshold value is selected based, in part, on the quality metrics received frames and can be selected based on the quality metrics computed for decoded frames (Title, abstract). Chen figure 5 also shows plotting two probability density functions (i.e. PDFs) wherein the threshold 514 can be set at a value Xth such that a desired outcome is achieved.

It would have been obvious for any one of ordinary skill in the art at the time the invention was made to modify the codec as taught by Hollier to utilizes a probability density function that classify signals as taught by Malvar or Di Pietro or Chen so that the codec may classify a signal or set a value such that a desired outcome is achieved.

Regarding claims 2-9, 19-22, 31-33, 38, 42-48, and 50-53. Hollier does not explicitly show using one empirically derived mathematical probability distribution function.

Malvar teaches a system and method for real time parametric modeling for a probability distribution function that approximates the users perception of the quality of a voice connection (abstract, columns 1-4, col. 5 lines 30-67, columns 7-12, col. 13 line 43 – col. 16 line 66, col. 18 line 50+). Malvar discloses using a modified probability distribution model wherein the shape is controlled by a single parameter, which is directly related to the peak value of the coefficients (columns 19-22) thus minimizing computational overhead for model selections.

Di Pietro teaches a method and apparatus for automatically and reproducibly rating the transmission quality of a speech transmission system wherein differences between characteristic values are feed to a neural network which classifies the quality of

the difference signals as Good, Medium and Bad, and a defuzzyfication logic circuit further refines the quality classification output (Title, abstract). Di Pietro figure 5 shows that the tree outputs are scaled into a range of 0 to 1 and the final classification is determined by calculating the center of the area covered by the Good, Medium and Bad signal. Di Pietro also discloses that the so-called Bark scale may be used to define a twodimensional spectrogram.

Chen also teaches a method and apparatus for detecting zero rate frames in a communications system wherein a quality metric is computed and compared against a threshold value. The threshold value is selected based, in part, on the quality metrics received frames and can be selected based on the quality metrics computed for decoded frames (Title, abstract). Chen figure 5 also shows plotting two probability density functions (i.e. PDFs) wherein the threshold 514 can be set at a value Xth such that a desired outcome is achieved.

It would have been obvious for any one of ordinary skill in the art at the time the invention was made to modify the codec as taught by Hollier to utilizes a probability density function that classify signals as taught by Malvar or Di Pietro or Chen so that the codec may classify a signal or set a value such that a desired outcome is achieved.

Regarding claims 10, 26, 34, and 39-41. Hollier teaches at least one characteristic is echo and delay (col. 1 lines 15-67, col. 2 lines 30-67, columns 5-6).

Regarding claims 11, 27, and 35. Hollier teaches a packet switch network (#20 figure 1).

Regarding claim 12, 28, 36. Hollier teaches a circuit switch network (#20 figure 1).

Regarding claim 13, 30. Hollier teaches a network interface (see interface between #30 and #40 figure 2).

Regarding claims 14. Hollier teaches

a memory (#30, #40, #70 and #80 figure 2); and

an interface control circuit coupled to the memory (col. 9 lines 6-67, #30, #40, #70 and #80 figure 2).

Regarding claim 15. Hollier teaches a circuit switch device (#20 figure 1).

Regarding claim 16. Hollier teaches a packet switch device (#20 figure 1).

Regarding claim 17. Hollier teaches a telecommunication device (#20 figure 1).

Regarding claims 23-25. Hollier does not explicitly show one characteristic as an independent variable.

Malvar teaches a system and method for real time parametric modeling for a probability distribution function that approximates the users perception of the quality of a voice connection (abstract, columns 1-4, col. 5 lines 30-67, columns 7-12, col. 13 line 43 – col. 16 line 66, col. 18 line 50+). Malvar discloses using a modified probability distribution model wherein the shape is controlled by a single parameter, which is directly related to the peak value of the coefficients (columns 19-22) thus minimizing computational overhead for model selections.

Di Pietro teaches a method and apparatus for automatically and reproducibly rating the transmission quality of a speech transmission system wherein differences

between characteristic values are feed to a neural network which classifies the quality of the difference signals as Good, Medium and Bad, and a defuzzyfication logic circuit further refines the quality classification output (Title, abstract). Di Pietro figure 5 shows that the tree outputs are scaled into a range of 0 to 1 and the final classification is determined by calculating the center of the area covered by the Good, Medium and Bad signal. Di Pietro also discloses that the so-called Bark scale may be used to define a twodimensional spectrogram.

Chen also teaches a method and apparatus for detecting zero rate frames in a communications system wherein a quality metric is computed and compared against a threshold value. The threshold value is selected based, in part, on the quality metrics received frames and can be selected based on the quality metrics computed for decoded frames (Title, abstract). Chen figure 5 also shows plotting two probability density functions (i.e. PDFs) wherein the threshold 514 can be set at a value Xth such that a desired outcome is achieved.

It would have been obvious for any one of ordinary skill in the art at the time the invention was made to modify the codec as taught by Hollier to utilizes a probability density function that classify signals as taught by Malvar or Di Pietro or Chen so that the codec may classify a signal or set a value such that a desired outcome is achieved.

Regarding claim 54. Hollier teaches wherein the computer readable medium is selected form the group consisting of a dram, rom, prom, eeprom, a hard drive, or compact disk (columns 7-11, figures 1-5).

Regarding claims 55-58. Hollier teaches the telecommunications switching device coupled to the computer readable medium (see figures 1-2).

Regarding claim 59-60. Hollier teaches test quality measurement system (Title, abstract, figures 1-2).

Response to Arguments

2. Applicant's arguments filed 1/22/03 have been fully considered but they are not persuasive.

a) Regarding Applicant's brief remarks starting on page 6 (i.e. section "A.") and continuing to page 13 (i.e. section "B.") wherein Applicant's contend that neither Hollier, Malvar, Di Pietro, nor Chen suggest or disclose a processor operative calculate a solution to at least one empirically derived mathematical function by using at least one measured characteristic as an independent variable, etc.

The Examiner respectfully disagrees. Hollier is silent with respect to using at least one measured characteristic as an independent variable (see Examiner rejection listed above).

Malvar teaches a system and method for real time parametric modeling for a probability distribution function that approximates the users perception of the quality of a voice connection (abstract, columns 1-4, col. 5 lines 30-67, columns 7-12, col. 13 line 43 – col. 16 line 66, col. 18 line 50+). Malvar discloses using a modified probability distribution model wherein the shape is controlled by a single parameter, which is directly related to the peak value of the coefficients (columns 19-22) thus minimizing computational overhead for model selections. **Furthermore, Malvar defines a "BARK**

SCALE" see column 13 lines 43+. Column 15 reveals scalar quantization wherein the final weighting function determines the spectral shape of the quantization noise that would be minimally perceived, as per the model discussed above. Column 16 even reveals a unique representation having probabilities. Column 18 and figure 16 reveals probability modeling. More importantly, columns 19-20 reveal that parametric modeling uses a model for a probability distribution function (PDF) of the quantized and run-length encoded transform coefficients. Please see column 19 lines 17+ wherein "Usually, codecs that use entropy coding (typically Huffman codes) derive PDFs (and their corresponding quantization tables) from histograms obtained from a collection of audio samples. In contrast, the present invention utilizes a modified Laplacian+exponential probability density fitted to every incoming block, which allows for better encoding performance. **One advantage of the PDF model of the present invention is that its shape is controlled by a single parameter**, which is directly related to the peak value of the quantized coefficients. **That leads to no computational overhead for model selection, and virtually no overhead to specify the model to the decoder**". **Please see column 19 lines 17+ wherein** "Specifically, the probability distribution model of the present invention preferably utilizes a modified Laplacian+exponential probability density function (PDF) to fit the histogram of

quantized transform coefficients for every incoming block. **<u>The PDF model is controlled by the parameter A described</u>** in box 1510 of FIG. 15 above (it is noted that A is approximated by vr, as shown by box 1512 of FIG. 15). Thus, the PDF model is defined by: ##EQU10##".

b) Furthermore, regarding Applicant's general remark on page 8 wherein Applicant's contend that Malvar does not employ a probability distribution function that approximates the user perception of the quality of a voice connection. Malvar does not have to because Applicant's independent claim is silent with respect to PDF. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., probability distribution function) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). **Furthermore, Applicant's cannot deny the fact that Malvar indeed focuses on "codec" system (please see first line of abstract).**

c) Regarding Applicant's brief remark on page 8 regarding Di Pietro wherein Applicant's generally state that Di Pietro does not teach, suggest, or disclose a processor operative calculate a solution to at least empirically derived function.

The Examiner disagrees. See column 8 wherein a "non-linear" function is used having "x" as the argument of the function. Furthermore, Di Pietro also discloses using the so-called "Bark Scale" **<u>and defining a twodimensional array</u>** wherein the Bark

scale is based on the physiology of the human ear and **it is therefore an appropriate basis for defining characteristic values** (see bottom of column 8 continuing to column 9).

d) Regarding Applicant's brief remark at the bottom of page 8 regarding Chen wherein Chen uses Gaussian distributions. Applicant's assertion is irrelevant because Applicant's fail to define or argue Applicant's invention, nor do Applicant's exclude and/or include the "Gaussian distribution" in Applicant's independent claim. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Gaussian distribution) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In summation, Chen also teaches a method and apparatus for detecting zero rate frames in a communications system wherein a quality metric is computed and compared against a threshold value. The threshold value is selected based, in part, on the quality metrics received frames and can be selected based on the quality metrics computed for decoded frames (Title, abstract). Chen figure 5 also shows plotting two probability density functions (i.e. PDFs) wherein the threshold 514 can be set at a value Xth such that a desired outcome is achieved.

e) Regarding Applicant's general statement on page 9 regarding dependent claim 2 where Applicant's argue that neither Hollier, Malvar, Di Pietro, nor Chen teach

using PDFs. The Examiner respectfully disagrees (see Rejection listed above as well as sections a-d listed above).

f) Regarding Applicant's remark regarding claim 18 appearing at the bottom of page 9 wherein Applicant's contend that Examiner provides no independent analysis for claim 18. The Examiner respectfully disagrees. See rejection listed above. The Examiner further notes that method claim 18 is rejected for the same reason as apparatus claim 1 since the recited apparatus would perform the claimed steps.

g) Applicant's continue to argue that the Examiner does not provide an independent analysis of program claim 29. The Examiner respectfully disagrees. Program claim 29 is nothing more than the combination of Apparatus claims 1 and 14 as well as method claim 18. Therefore, program claim 29 is rejected for the same reasons as apparatus claims 1 and 14 and corresponding method claim 18 since one of minimum skill in the art would expect some sort of program to operate the apparatus.

h) Applicant's again argue that the Examiner failed to provide an independent analysis of claim 37 on page 11. The Examiner respectfully disagrees. Independent claim 37 is nothing more than the combination of previous rejected claims 1, 18 and 29 and therefore is rejected for the same reasons as claims 1, 18 and 29.

i) Applicant's again argue that Examiner does not provide an independent analysis for claim 49. The Examiner disagrees since one of minimum skill in the art would expect some sort of program to operate the apparatus as well as some sort of computer readable medium for storing such program.

j) Applicant's continue to argue that the Examiner does not provide an independent analysis of program claim 61. The Examiner respectfully disagrees because one of minimum skill in the art would expect some sort of program to operate the apparatus.

k) Regarding Applicant's brief remarks starting on page 13 (i.e. "B.") and continuing to page 15 wherein Applicant's argue that there is no suggestion or motivation to modify the references or to combine reference teachings. Applicants contend that the Examiner fails to point out where the above motivational statement can be found.

The Examiner respectfully disagrees. Hollier does not explicitly show the at least one measured characteristic as an independent variable.

Malvar teaches a system and method for real time parametric modeling for a probability distribution function that approximates the users perception of the quality of a voice connection (abstract, columns 1-4, col. 5 lines 30-67, columns 7-12, col. 13 line 43 – col. 16 line 66, col. 18 line 50+). Malvar discloses using a modified probability distribution model wherein the shape is controlled by a single parameter, which is directly related to the peak value of the coefficients (columns 19-22) thus minimizing computational overhead for model selections. **Furthermore, Malvar defines a "BARK SCALE" see column 13 lines 43+. Column 15 reveals scalar quantization wherein the final weighting function determines the spectral shape of the quantization noise that would be minimally perceived, as per the model discussed above. Column 16 even reveals a unique representation having probabilities. Column 18**

and figure 16 reveals probability modeling. More importantly, columns 19-20 reveal that parametric modeling uses a model for a probability distribution function (PDF) of the quantized and run-length encoded transform coefficients. Please see column 19 lines 17+ wherein "Usually, codecs that use entropy coding (typically Huffman codes) derive PDFs (and their corresponding quantization tables) from histograms obtained from a collection of audio samples. In contrast, the present invention utilizes a modified Laplacian+exponential probability density fitted to every incoming block, which allows for better encoding performance. **One advantage of the PDF model of the present invention is that its shape is controlled by a single parameter**, which is directly related to the peak value of the quantized coefficients. **That leads to no computational overhead for model selection, and virtually no overhead to specify the model to the decoder**". **Please see column 19 lines 17+ wherein** "Specifically, the probability distribution model of the present invention preferably utilizes a modified Laplacian+exponential probability density function (PDF) to fit the histogram of quantized transform coefficients for every incoming block. **The PDF model is controlled by the parameter A described** in box 1510 of FIG. 15 above (it is noted that A is approximated by vr, as

shown by box 1512 of FIG. 15). Thus, the PDF model is defined by: ##EQU10##".

Di Pietro teaches a method and apparatus for automatically and reproducibly rating the transmission quality of a speech transmission system wherein differences between characteristic values are feed to a neural network which classifies the quality of the difference signals as Good, Medium and Bad, and a defuzzyfication logic circuit further refines the quality classification output (Title, abstract). Di Pietro figure 5 shows that the tree outputs are scaled into a range of 0 to 1 and the final classification is determined by calculating the center of the area covered by the Good, Medium and Bad signal. Di Pietro also discloses that the so-called Bark scale may be used to define a twodimensional spectrogram. **Furthermore**, Di Pietro also discloses using the so-called "Bark Scale" **and defining a twodimensional array** wherein the Bark scale is based on the physiology of the human ear and **it is therefore an appropriate basis for defining characteristic values** (see bottom of column 8 continuing to column 9).

Chen also teaches a method and apparatus for detecting zero rate frames in a communications system wherein a quality metric is computed and compared against a threshold value. The threshold value is selected based, in part, on the quality metrics received frames and can be selected based on the quality metrics computed for decoded frames (Title, abstract). **Chen figure 5 also shows plotting two probability density functions (i.e. PDFs) wherein the threshold 514 can be set at a value Xth such that a desired outcome is achieved**.

It would have been obvious for any one of ordinary skill in the art at the time the invention was made to modify the codec as taught by Hollier to utilizes a probability density function that classify signals as taught by Malvar or Di Pietro or Chen so that the codec may classify a signal or set a value such that a desired outcome is achieved.

Furthermore, the Examiner even provided Applicant's with addition reference that read on Applicant's general claim language (see referenced cited by Examiner listed: ***Meyers et al (5,715,372) is considered pertinent for method and apparatus for characterizing an input signal via PDF***). The Examiner also notes that Di Pietro even cited the Meyers patent therefore the motivation would be self evident to one of ordinary skill in the art versed in the Meyers patent, to provide a measurement technique which is independent of various voice coding algorithms and consistent for any given algorithm (see Meyers column 2 lines 44-47). To one of ordinary skill in the art having two references would not have been discouraged from modifying the CODEC of Hollier with an old well known measurement technique as evidenced by Meyers cited by Di Pietro.

L) Regarding Applicant's brief remarks starting on page 14 and continuing to page 15 wherein Applicant's contend that the Examiner failed to answer the Applicant's previous arguments.

Since Applicant's previous arguments are similar in scope to Applicant's current arguments, the Examiner response listed directly above covers Applicant's previous arguments, as well as, Applicant's current arguments.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

---(5,715,372) Meyers et al is considered pertinent for method and apparatus for characterizing an input signal via PDF.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry W. Taylor whose telephone number is (703) 305-4811. The examiner can normally be reached on Monday-Friday from 6:30am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on (703) 305-4708. The fax phone number for this Group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Technology Center 2600 customer service Office whose telephone number is (703) 306-0377.

CURTIS KUNTZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600